of the labyrinth. Many of the cases of chronic suppurative otitis media that have tuberculosis die if not operated on. Reasoning in such a way, we must believe that it is inoculated by way of the Eustachian tube rather than from the blood stream.

Dr. J. J. Kingwell: I want to state a case which has been in my hands for the last two weeks—a patient with positive tuberculosis of the intestines and lungs. Two weeks ago she had a coughing spell, followed by a severe pain and fullness in the ear. Within two days she sent for me. The canal had the appearance of an acute otitis—drum bulging, hyperemic. I did a paracentesis, but found no pus or serum. It was treated antiseptically. About a week ago I was called to see her again. The mucous membrane was swollen and pus exuded. A swab taken from the same proved positive tubercle bacilli. There are no symptoms of mastoiditis.

Dr. H. S. Moore: Speaking of tuberculosis of the nose or larynx: In a short paper I read a few months ago, I said I really believed it would be proven that there are no primary infections in the larynx; there may be in the nose. I ran a series of 200 cases in the Tuberculosis Clinic of Stanford having this point in mind, and Dr. Clark, the internist, always found the primary lesion elsewhere.

Dr. H. B. Graham: I want to thank Dr. Ophüls for the remarkably clear paper he has presented, and compliment him on the way he stuck to his subject—so much better than we get in our discussion.

I think we have not yet enough data to make a decision as to whether or not primary tuberculosis of the larynx actually occurs. The teaching in Vienna by Albrecht—who made a special study of tuberculosis throughout the body, its routes of infection—was that primary tuberculosis of the larynx was practically unknown, and that if it did occur, it was practically unknown to him. At one period, when he was working in the Allgemeine Krankenhaus, he found that in all cases of tuberculosis of the larynx, he could find healed active or passive lesions in the lungs or other portions of the body, which seemingly antedated the lesions in the larynx.

I believe in most of the cases that we say clinically are cases of secondary tuberculosis of the larynx, the route of infection is by the lungs and bronchial lymph nodes, or by sputum coughed up into the larynx. I simply repeat what Albrecht gave us in our work there, so my remarks are based entirely upon his findings.

I have been much interested in the subject of tuberculosis of the ear and the route of infection there because two years ago I had occasion to operate a case of tuberculosis of the nasopharynx in whom I had some time before made a diagnosis of tuberculosis of the middle ear. The patient was a very healthy woman of 35 who showed no evidences of ever having had tuberculosis of the lungs. She had a typical picture of tuberculosis of one ear which had healed spontaneously, leaving a latent labyrinthitis. When I saw her she had a picture of an acute middle ear tuberculosis on the other side. I hesitated about operating that side because she had already lost the one ear. In the course of my observations I found a granulating area on the vomer. It was limited entirely to the septum and was ulcerated and not lupoid. The lesion was curetted and sent to the microscopist and was returned with the diagnosis of tuberculosis. The lesion in the nasopharynx healed under cauterization and curettement after two months.

I am pretty positive that in this case the route of infection was from the nasopharynx into the ears. I do not believe that was a hematogenous infection; I do not believe, with Dr. Ophuls and the men he has quoted, that the route of infection is hematogenous but by the Eustachian tube.

I had occasion to look over the literature about a year ago for a paper which is to be published very soon on tuberculosis of the middle ear, and in all the literature I never found a case where there was not a very grave doubt of the hematogenous origin of the tuberculous lesion. The cases in the English literature are simply worthless; those in the German literature are very doubtful. It is so easy to believe that the tubercle bacillus may be coughed up into the Eustachian tube that it seems to be stretching the imagination to take that tubercle bacillus through the body in the blood stream.

A STATISTICAL STUDY OF RABIES IN CALIFORNIA.

By J. C. GEIGER, M. D.
Assistant Director, Bureau of Communicable Diseases of the California State Board of Health, Berkeley.

Since 1909, and until recently, rabies has been epidemic in California. Despite the dissemination of knowledge in regard to the control of the disease, rabies among animals in California steadily increased. The height of the epidemic has been reached and passed, and rabies may be considered under control except in Modoc and Lassen counties.[1] This is partly due to the peculiar tendency of an epidemic of rabies to spend itself, the measures instituted for control, and the fact that the disease has become endemic in the more populous communities.

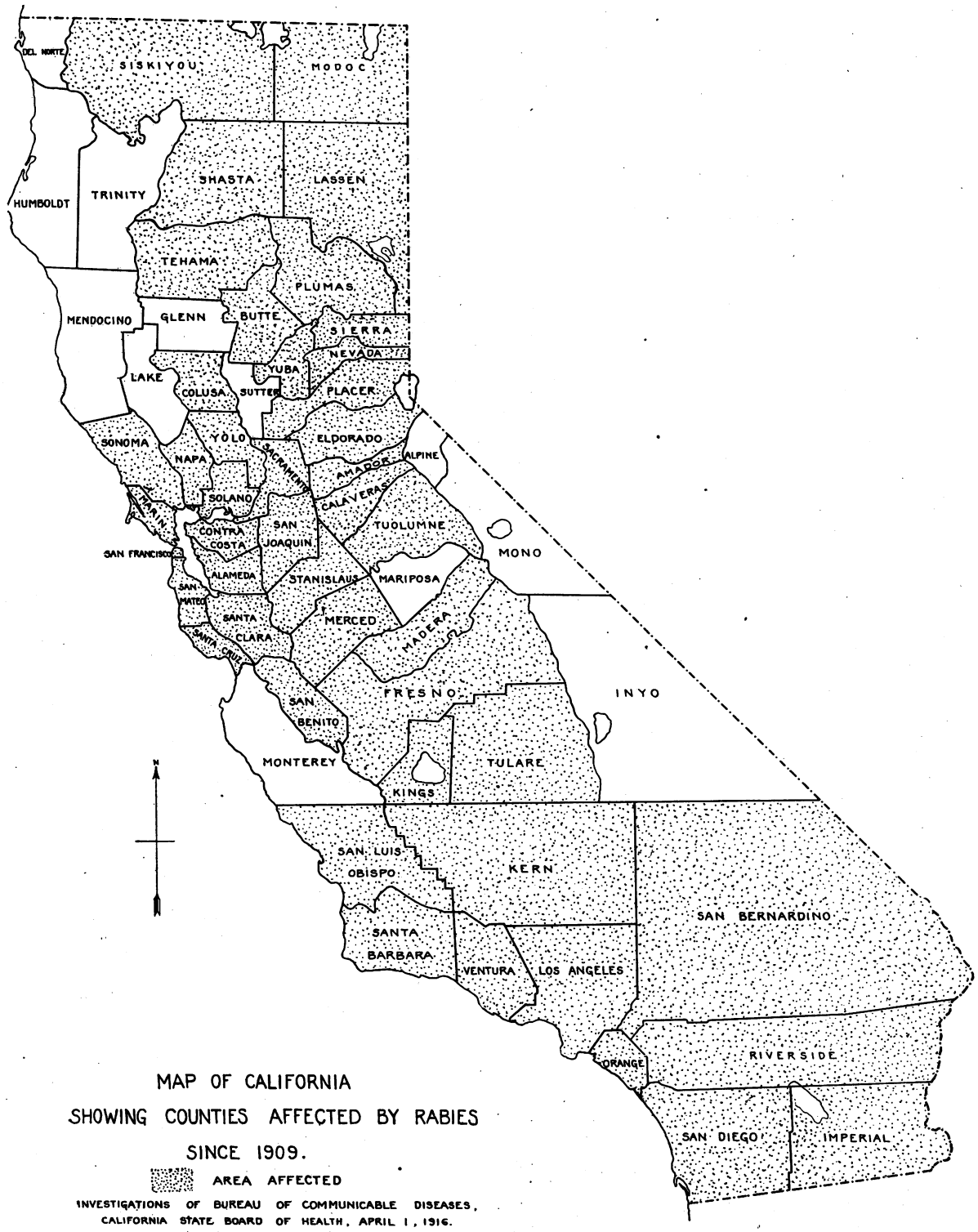
The advent of the disease in coyotes in Modoc and Lassen counties, which was accomplished through infection traveling from Oregon and Nevada, was made the basis of a remarkable campaign against these animals by the California State Board of Health. The financial loss in livestock alone in Modoc and Lassen counties from rabies places this disease in the forefront as the enemy of the cattle and sheep men. Therefore, the prompt eradication of rabies is a necessity, both in city and rural communities, because of the serious element of human danger on the one hand, as shown by the large number of deaths from rabies in human beings in California, and from an economic standpoint on the other, as shown by the experience of Modoc and Lassen counties.

RESULTS OF LABORATORY EXAMINATIONS.

Beginning April 1, 1913, and ending March 31, 1914, 427 examinations of the brains of animals for rabies have been made in this laboratory. Of these specimens, nine were in such a state of decomposition as to make examination impossible. Seventy brains gave negative results and 348 were found positive. Three hundred and thirty-nine of the positive cases were diagnosed by the finding of Negri bodies and the balance by inoculation into rabbits and guinea-pigs. The animals affected were as follows: 317 dogs, 14 cows, 11 cats, 4 horses, 1 goat, 1 coyote.

We have received reports of the biting of 235 human beings and 207 animals by the animals proved positive by our examinations. As to months, the highest number of examinations were made in the cold months, December and January. This does not substantiate the popular belief in increased prevalence in summer. Twenty-five posi-

1 Geiger, J. C.: Is Rabies Under Control in California? Cal. State Jour. Med. February, 1916.



MAP OF CALIFORNIA
SHOWING COUNTIES AFFECTED BY RABIES
SINCE 1909.

AREA AFFECTED

INVESTIGATIONS OF BUREAU OF COMMUNICABLE DISEASES,
CALIFORNIA STATE BOARD OF HEALTH, APRIL 1, 1916.

tive examinations were made in April, 22 in May, 23 in June, 22 in July, 25 in August, 21 in September, 38 in October, 20 in November, 44 in December, 43 in January, 34 in February, and 31 in March. The counties affected were as follows: Alameda 83, Santa Clara 50, San Joaquin 29, Placer 26, Fresno 20, Contra Costa 15, San Mateo 15, Kings 13, Sonoma 12, Sacramento 10, Nevada 9, San Bernardino 7, Stanislaus 7, Tulare 7, Butte 6, San Diego 6, Los Angeles 5, Merced 5, San Francisco 4, Napa 4, Calaveras 4, Amador 3, Imperial 3, Tehama 2, Marin 2, San Benito 2, Santa Cruz 2, Kern 2, Solano 1, Orange 1, El Dorado 1, San Luis Obispo 1, Yolo 1, Riverside 1, Ventura 1, Colusa 1. This makes a total of 36 counties against 31 of the previous year. One positive examination was made for the Oregon State Board of Health.

It must not be forgotten that diagnostic and other work is also done by municipal and private laboratories. For instance, the laboratory of the San Francisco Board of Health has made 71 positive examinations from April 1, 1913, to March 31, 1914; the laboratory of the City of Sacramento 3, the laboratory of the City of Los Angeles 2, and the laboratory of the City of Oakland 185. These figures show a remarkable redistribution of the areas of greatest involvement. This is strikingly shown when the figures are contrasted with those of the preceding year, which are as follows: San Francisco Health Department 279, Los Angeles 22, Sacramento 29, and Oakland none.

Beginning April 1, 1914, and ending March 31, 1916, a period of two years, 239 positive examinations of the brains of animals for rabies have been made in this laboratory. Of these, 10 were proven positive by animal inoculation, and the balance by the finding of Negri bodies on microscopical examination. The animals affected were as follows: 130 dogs, 45 coyotes, 27 cows, 16 calves, 8 cats, 4 horses, 3 sheep, 3 human beings, 2 bobcats, and 1 goat.

We have received reports of the biting of 142 human beings, 165 animals by the animals proved positive by our examinations. The counties affected were as follows: Modoc 78, Lassen 31, Alameda 19, Santa Clara 12, Fresno 11, Tulare 10, San Mateo 9, Contra Costa 7, Santa Cruz 7, Shasta 7, Kings 7, Tuolumne 6, Imperial 5, Stanislaus 4, Riverside 4, San Diego 3, San Benito 3, Siskiyou 2, Madera 2, Los Angeles 1, Napa 1, Placer 1, San Joaquin 1, Sonoma 1, Nevada 1, Santa Barbara 1, Tehama 1, Sacramento 1, Plumas 1, Sierra 1, and Yuba 1.

It is interesting to note the large number of animals proven positive that were received from Modoc and Lassen counties. Yet this number, large as it is, and representing only a period of a few months, is no index to the actual number of cases of rabies that have occurred in these counties. The large number of positive cases, practically sudden in their appearance, is what can be expected when rabies makes its appearance in a community where heretofore it never existed.

Two positive examinations were made for the Oregon State Board of Health. The laboratory of the City of Oakland in this period reports 43 positive examinations, the laboratory of the City of Los Angeles 20, the laboratory of the City of San Francisco 11, and the laboratory of the City of Sacramento 5. Considering the 970 positive cases reported up to April 1, 1914,[2] we have as a grand total 1,897 positive examinations for rabies in the State of California for the present epidemic up to date, 1,078 of which were dogs.

PASTEUR TREATMENT.

The widespread prevalence of rabies in California, as shown by the figures just presented, has made it necessary that the large number of persons bitten by animals known or suspected to have been rabid, to take the preventive treatment for rabies. The State Hygienic Laboratory and its branches, as well as bacteriologists deputized by the California State Board of Health in different cities of the State and at the Letterman General Hospital and the Mare Island Navy Yard, administer the Pasteur treatment free of charge. The treatments are given on the approval of the local health authority of the application of the patient, parent or guardian that it would be a hardship to pay for the treatment at the usual rates.

The 436 persons treated with virus obtained from this Bureau came from the several counties as follows: Alameda 139, San Francisco 75, Los Angeles 51, San Diego 21, Santa Clara 18, Sacramento 17, Placer 12, Contra Costa 9, Santa Cruz 9, Fresno 8, San Joaquin 8, San Mateo 7, Napa 6, Orange 6, Modoc 6, Ventura 5, Stanislaus 5, Butte 3, Sonoma 3, Kings 3, Shasta 3, San Bernardino 3, Amador 2, Yolo 2, San Luis Obispo 2, Lassen 2, Tehama 1, Monterey 1, Placer 1, Santa Barbara 1, Tulare 1, Marin 1, Sierra 1. Two treatments were supplied to the Arizona Board of Health, one to the surgeon in charge of the Mare Island Navy Yard, and one to the surgeon in charge of the Letterman General Hospital, Presidio, San Francisco.

The infection came from the bites of dogs in 403 instances, in nine cases from the bites of cats, and in four cases from the bites of coyotes. Six people were exposed to rabid cows and three to horses. Nine persons took the treatment as a precaution against exposure while doing laboratory examinations for rabies. The two remaining cases were inoculated with virus from human cases, one because of a bite and one because the saliva contaminated a fresh open burn.

Considering the number of persons treated during the time under consideration, 436, and the 205 persons treated and reported in a previous paper,[2] we have the sum total of 641 persons treated with virus manufactured by this Bureau. The scheme of treatment that has been in use at this Bureau up to April 1, 1916, has been the same as described in Bulletin No. 65 of the Hygienic Laboratory of the United States Public Health Service.

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2 Geiger, J. C.: The Work of the Pasteur Division of the State Hygienic Laboratory. Cal. State Jour. Med. August, 1913.

Of the cases of rabies in human beings, three were true failures of the Pasteur treatment, all being severely bitten, two near the central nervous system. Eliminating all persons treated who were not bitten, the percentage of failures with virus supplied by this Bureau was .491, less than ½ of 1 per cent. These statistics are extremely important and unique because of the fact that in over 98% of the persons bitten, the animals doing the biting were checked by laboratory examinations, with positive results.

There were few ill effects following the Pasteur treatment during the period under consideration. In one case treated at this Bureau, some weeks after treatment there was a peculiar twitching of the muscles of the right side of the neck. In another patient 11 days following the completion of the treatment there was severe pains in the left eye, later affecting the side of the face. This was present at intervals for about a week. In one of the cases there was vomiting. This occurred every day for a short period of time and stopped after the completion of the Pasteur treatment. In another patient the local reactions that usually appear on certain days of the treatment from different strength virus occurred after each injection. In four instances subcutaneous abscesses developed. The only serious complication reported was a slight paralysis of the lower limbs, with prodromal symptoms of nausea and diarrhea, which occurred several days after the completion of the Pasteur treatment.

The large number of persons to whom the Pasteur treatment was administered, with the resulting low mortality, is sufficient evidence of its efficiency. Rabies being one of the easily eradicated infectious diseases, there should be no excuse for its presence in any community. The dog, as it has been aptly put, being the principal reservoir of the disease, eradication can be accomplished surely and expeditiously by rigid enforcement of muzzling plus a strict interstate quarantine of at least six months. In California, now that the disease is rampant in the coyote, there is urgent need of active state co-operation with the United States Biological Survey in their commendable campaign of destruction of the predatory animals.

DANGER OF BATHS IN PATIENTS SUFFERING FROM ARTERIO-SCLEROSIS.*

By DR. WILLIAM WATT KERR, San Francisco.

As the time of year is at hand when people are arranging to leave town for the summer months the following cases may be of interest to those physicians who are liable to be consulted by their patients regarding the propriety of visiting one or other of the many springs which abound in California. It not infrequently happens that too little attention is given to the fitness of individual cases to hydro-therapy, and consequently harm is done to the patient and also to the reputation of the particular spa which he chanced to select, so that others who would receive benefit are deterred by their friend's misfortune from availing themselves of the treatment. The popular idea that the surroundings at the various resorts are responsible for all improvement, and that although the baths may fail to relieve yet they never will do any harm, is extremely unfortunate. At least two things should be impressed upon those seeking advice: (1) that hydro-therapy is not adapted to all cases, (2) that the temperature and method of administration are of much greater importance than any salts contained in the water. This knowledge would prevent many. undesirable cases from going to the sanatoria, and might also bring to reason many of the guests who, in a desire to be thorough or "get their money's worth," drink too much of the water or indulge in too frequent or prolonged immersion. The cases mentioned tonight are only examples of one of the groups that require exclusion from the baths or very careful supervision during their administration; it is not always possible to tell from physical examination the condition of a man's arteries, because the peripheral vessels may be comparatively healthy while the coronaries and splanchnics are seriously diseased, and therefore in all patients after middle life the first baths should only be given in the presence of an expert medical attendant who is capable of estimating their influence upon the balance between cardiac strength and arterial resistance.

Case 1. A gentleman, aged 58, for nearly three years had been subject to radiating substernal pain that was readily induced by exertion, such as climbing seven or eight steps of a stair, especially if the exertion were undertaken soon after meals. Some time ago, while living at a summer resort where there were hot mineral springs, he commenced a series of baths, and it is only to the effect of these that I wish to call attention. The water came from the ground at a temperature of 140 Fahr., and contained a variety of salts, the most abundant being sodium carbonate, sodium bicarbonate, silica, and a trace of calcium. As I was spending part of my vacation at the same place I had an opportunity of observing him daily, and watching the effects of the baths. In addition to the water consumed before and between meals, the patient was instructed to drink eight ounces of it hot when he went into his bath, and another eight ounces as he was lying in the cooling-room afterwards. The bath consisted of complete immersion, with the exception of the head, in the mineral water that was easily kept at a temperature of between 103 and 104 Fahr. by allowing the hot water to flow in continuously; the time limit was from ten to fifteen minutes, and after the first eight minutes light friction was commenced over the entire body. Upon getting into the bath the patient found the warmth very agreeable, but when about seven minutes had elapsed, he experienced a sensation of fullness behind the sternum to which he did not attach any importance, and made no mention of the fact. The pain so increased during the rubbing that at the expiration of other three minutes the suffering was so great that he could hardly get out of the bath even with assistance, and had to sit down until sufficiently recovered before walking into the cooling-room, a feat that could only be accomplished by resting three or four times on the way. Here he lay down upon the cot, but the slight increase in pressure, consequent upon assuming the horizontal position, caused the pain to return, so that it was fully twenty minutes later before he could recline with his head and shoulders supported upon six or seven pillows. Next day the resident physician told him not to take any water before enter-

*Read before the San Francisco County Medical Society, March 7, 1916.